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Abstract

A survey of Danish food industry firms is used to examine firms' views on developments in conduct throughout the Danish food marketing chain. Against expectations, there is weak evidence of narrowing food channels, particularly on the buying side. There is evidence of concentration amongst sellers, and to a lesser extent amongst buyers. Against expectations, concentration amongst buyers and sellers is easing. Most firms identify retailers as the holders of market power, and claim that the market power is exercised as within-chain actions such as slotting fees and the shifting of risks. This differs markedly from the actions claimed by the firms identifying processors as the holders of market power. Few firms identified market power as a constraint on new products' development and introduction. Although many firms claimed that retailers' own-label brands are used as instruments of market power, a qualified majority of firms also expressed enthusiasm for such brands in their marketing plans. However, most firms claimed that retailers' own-label brands are less profitable than private brands. The paper presents tables of results that extend to consideration of firms attributes in their responses to survey questions. It is concluded by a discussion section and identified future research topics.

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Preface

This Working Paper presents firms' views on competition and transactions within the Danish food and agricultural marketing chain, as expressed in survey responses. This research is conducted under the auspices of the project "Perspektiver for og Udvikling af den danske fødevarekæde (phase 2)", commonly known as "the food chain project". This project is funded under the Inovationsloven and administered by the Directorate of Food, Fisheries and Agribusiness (DFFE) of the Danish Ministry of Agriculture.

Thanks are due to Mogens Lund for a review of drafts of the paper.

Division Director, Production and Technology, Mogens Lund
Institute of Food and Resource Economics
Copenhagen, December 2007

1. Introduction

1.1. Background

Competition in agriculture and the food industry is a subject attracting considerable attention from researchers and industry commentators, as well as policy makers and food industry firms. In the past, food industry competition has been interpreted mainly in the context of farm incomes and consumer expenditures on food. More recently, conduct within the food marketing chain and the resultant allocation of added value have gained prominence. However, few studies have addressed the actions and experiences of firms, nor their expressed views on such developments. The Danish food industry is characterised by extreme concentration at all stages of the food marketing chain across most commodity sectors, which offers potential for the exercise of market power in a range of settings. To the author's knowledge, this study is the first attempt to quantify such behaviour and its impacts by using firms' recent experience.

1.2. Purpose of study

The intended audience for this Report includes firms and industry organisations, as well as policy makers. It has the following objectives:

1. To present firms' views on competitive structures and practices in the Danish food industry;
2. To discuss those views in the light of past research;
3. To draw conclusions of interest to firms and policy makers; and
4. To identify topics requiring further research.

1.3. The "Food Chain Project"

This research is conducted under the auspices of the project[1] "Perspektiver for og Udvikling af den danske fødevarekæde (phase 2)", commonly known as "the food chain project". This project is funded under the Inovationsloven and administered by the Directorate of Food, Fisheries and Agribusiness (DFFE) of the Danish Ministry of Agriculture. The objectives of the project are to:

- measure changes in function, structure and commercial practice in the Danish food industry and compare and contrast these with developments in other countries;

[1] Further information about the project is available from the author at **db@foi.dk**.

- characterise vertical and horizontal relationships in the Danish food chain and their role in delivering optimal levels of food quality, variety and safety;
- evaluate the efficiency and competitiveness of the Danish food system at each stage of the marketing chain;
- review and evaluate instruments of Danish, EU and foreign public policy in the development of the food marketing chain; and
- communicate research results in a number of media.

1.4. Outline of Report

The following section identifies some current issues in economic analysis of within-chain competition in the food industry. Section 3 provides detail of the survey database and the nature of responding firms. These are applied in the discussion of the results presented in sections 4-7. Section 4 presents firms' reported numbers of trading partners and their dynamics and concentration. Section 5 summarises firms ' views on the location of market power within the food marketing chain and the means used to exercise it. Section 6 reports the use and nature of contracts within the food marketing chain and section 7 presents firms' use of, experience, and views on retailers' own-label brands. Section 8 is a discussion of results and their implications for firms and policy makers, as well as the research agenda for food industry competition. Section 8 contains a summary table for hypotheses tested.

2. Competition and transactions

2.1. Market power

Theoretical and practical views of competition centre on its capacity for, and role in, maximising social welfare as a consequence of production and consumption levels guided by markets and competitive pressures on prices. In essence, larger numbers of trading partners indicate "more competitive" industrial structures and the absence of barriers to firms' entry to and exit from industries. Conversely, few firms in an industry or serving a particular market provides potential for exercise of market power.

Conventionally, policy concern has centred on monopoly actions: restriction of market volumes in order to drive up prices; accompanied by barriers to entry by other firms that would expand market volumes. Analysis of market and industrial competitiveness has centred on numbers of firms, patterns of entry and exit, and the extent to which observed market prices exceed those that might be achieved in a more competitive market. Market power in input markets due to monopsony is in evidence where prices paid to suppliers are below those believed to be competitive.[2] However, because the firms in question are large and growing over the periods of analytical interest, profits are also affected by economies of scale and cost-related efficiencies. Identifying the separate effects of market power and scale economies has proven difficult.[3]

Studies of the entire food marketing chain are less common than analyses of firms at a single stage of the chain. They have used a range of formal and less formal methodologies, including algebraic models (e.g. Holloway, 1991), price transmission mechanisms (Suzuki et al., 1993), co-integration (Reed and Clark, 2000; and notably Jensen and Møller, 2007[4] for the Danish food industry), game theoretic bargaining models (Giulietti, 1996) and *ad hoc* comparisons of retail margins with processors-retailer relationships (Collins, 2002). This body of work delivers a range of results on market power qualified by economies of scale.

[2] Reviews of such studies in the food industry include Sheldon and Sperling (2003), Sexton and Lavoie (2001), Griffith (2000) and Digal and Ahmadi-Esfahani (2002).
[3] See Morrison Paul (2001).
[4] A study conducted under the auspices of the current project.

2.2. Change in the food sector

The food industry has experienced substantial consolidation[5] in recent decades. Reductions in numbers of firms at retail, wholesale and processing level are well documented for Denmark (Baker et al., 2007) where such trends between 1995 and 2000 were more extreme than in any other European country (Baker, 2003).[6] Similar trends have occurred in the United States (Rogers, 2001; USDA, 2002). Numbers of farm businesses are also in decline in most countries (Brouwer and Bijmann, 2001), as are numbers of input suppliers, banks and other service providers, and firms in allied industries such as food ingredients production. Proposed causes of consolidation are many, including the availability of economies of scale, scope, and the sporadic enthusiasm for merger and acquisition (OECD, 2003; Wrigley, 2001), including in Denmark (see Hanson, 2005) and in the context of cross-border mergers (Dobson, 1999; Marsden et al., 1997 and UK Competition Commission, 2000). This consolidation has been accompanied by concentration in the food industry (Viaenne and Gellynk, 1995; Baker, 2003) which is today at high levels throughout Europe and particularly in Denmark.

The consolidation and concentration of food retailing in Europe has been rapid and extreme (OECD, 2003), and has occurred in association with widespread acceptance that real consumer food prices are in decline rather than rising according to monopoly-type models. At the same time, supply chain developments have occurred that make some distribution and wholesale functions redundant or able to be adopted by retailers (Fearne and Hughes, 2002). This is just one element of vertically coordinated actions amongst food marketing chain participants, generally known as channel development. Occurring as it does amongst fewer and fewer firms, this process has been dubbed "food convergence" (Cotterill, 1997), which might follow several models associated either with dominant retailers or processors.

2.3. Vertical organisation in the food marketing chain

Relations within the food marketing chain, or "vertical organisation", has been examined in some depth by recent theoretical and applied research. This essentially describes a shift away from market transactions within channels, and toward a range of

[5] "Consolidation" is the phenomenon of declining numbers of firms in an industry. A related, but not equivalent, concept is "concentration", whereby market share is not evenly divided amongst remaining firms during consolidation. Rather, a few very large firms accumulate the majority of market share and the industry is said to have become "concentrated".

[6] Traill and Gilpin (1994) present similar results from an earlier period.

co-ordination activities whereby contracts, and other agreements linked to performance, guide relationships and exchange. Hanf and Dautzenburg (2006) describe a generalised model of vertically-oriented "network" that is led and/or dominated by a "focal firm".

A recent focus has been within-chain actions by retailers (as focal firms) that may involve monopsony action toward processors, as well as an array of actions purported to extract value added from suppliers for the benefit of retailers. These have aroused considerable concerns in policy circles (e.g. Office of Fair Trading, 2001; UK Competition Commission, 2000; OECD, 1999, 2003) and include, but are not restricted to: exclusive buying or selling practices; payments to ensure access to shelf space (so-called "slotting fees"[7]); requirements to pay promotion and advertising costs; physical delivery and stocking of shelves; and refunding of payment for unsold stocks or product failures. Such behaviour receives some limited support from some economists on efficiency grounds, particularly on the basis of efficient allocation of both effort and risk within the supply chain. On the other hand such behaviour has also been interpreted as a threat to new product introductions or innovation more generally in the supply chain (Harris, 2002). McLaughlin and Rao (1990) propose that new product introductions are the outcome of various shared, coordinated and co-requisite activities by firms at various points in the food marketing chain, an idea examined in case studies in Denmark by Boon (2001).

Hughes (2002) lists new product introduction (by a variety of methods and branding profiles) as just one element of implementation of strategies that increasingly characterise channels in the European food industry. Based on US experience, Sparks (1997) describes the ways in which a single retailer can use a range of qualities of retailers' own-label brands to implement a complex strategy. While brands are also thought to have been used as instruments of vertically-oriented market power (Baker et al., 2006; Connor, 1999), of particular interest to researchers have been retailers' own-label brands, which have accrued substantial market share in several European countries, including Denmark (UK Competition Commission, 2000). Retailers' own-label brands have been applauded and/or criticised by a variety of authors for their store-level (Collins, 2002), firm-level (Ward et al., 2002; Sparks, 1997) and industry level (Borghesani et al., 1997) impacts. In general, the firm-level effects on processors are thought to be positive in the sense of capacity utilisation, negative in the sense of pro-

[7] See McCorriston and Sheldon (1997) for an estimate of such transfers in the US food system.

ducing competing products, and ambiguous as regards the necessary exchange of information between retailers and processors.

In association with channel development has been the shift in policy emphasis toward systemic approaches to issues such as environment, food safety, traceability[8] and animal welfare. This chain-relevant approach is one element of what and Maxwell and Slater (2003) call "New Food Policy". With regard to food industry competition, "horizontal" antimonopoly and antitrust policies have, as a first line of defence, scrutiny of mergers and acquisitions. Two high profile mergers of food processors in Denmark received considerable attention across Europe in this regard.[9,10]

[8] More correctly known as "identity preservation" or "IP".

[9] Two pork processing firms (EU Case No COMP/M.2662 - DANISH CROWN/STEFF-HOULBERG), two Scandinavian dairy processing firms (Danish Competition Authority 1999, 2000, 2004a, b), and a British and Scandinavian dairy processor (UK Competition Commission 2003).

[10] Abuse of market power in the food chain in a vertical sense has prompted a number of actions by authorities in recent years, such as intervention in a dispute over one dairy processor's illegally enforcing exclusivity with a retailer, at the expense of a rival dairy processor (Danish Competition Authority, 2006).

3. Hypotheses, data and method

3.1. Hypotheses addressed in the study

Based on the foregoing, this study examines the hypotheses listed in table 1.

Table 1. Hypotheses to be tested

	Topic	Hypotheses
1	Numbers of sellers	• Decline 2000-2005
2	Numbers of buyers	• Decline 2000-2005
3	Concentration in trading partners	• Currently high • More intense 2000-2005
4	Firms' views on location of market power	• Most firms identify retailers
5	Form of market power exercised	• Differ depending on location of the market power • Differ depending on the type of firm making the claim • Changes in form 2000-2005 • Many firms will claim to experience within-chain instruments (e.g. slotting fees, shifts of risk), rather than conventional monopoly-monopsony action
6	Contracts	• More widely used 2000-2005 • Longer 2000-2005 • Changed in content 2000-2005 • Usage differs amongst types of firm • Content differs amongst types of firm
7	New product development	• Firms will claim that market power is a significant constraint
8	"Stricter anti-monopoly policy"	• Large firms view this as a threat, smaller firms as an opportunity
9	Retailers' own-label brands	• Not favoured by firms • Seen as less profitable than manufacturers' brands • Overall, seen as a negative thing

3.2. Method

Survey data are employed. Inference will be drawn based on comparisons of average results for years 2000 and 2005, and amongst dis-aggregations of data according to firm size, stage of marketing chain and other features.

3.3. Survey procedure

An interview-based survey of Danish food industry firms[11] was conducted November - December 2005 and March - June 2006. Draft questionnaires were prepared, and repeatedly circulated to 15 different organisations with an interest in food industry research, during the period May-October 2005. Six food industry firms made themselves available for testing of the later drafts of the questionnaire, in many cases being the subjects of numerous mock interviews. The comments, criticisms and proposals of both stakeholders and firms were, as far as possible, incorporated into questionnaire and research design.

The questionnaire comprised 5 sections. In the first, basic descriptive numeric information about firms was requested. The second section requested information about firms' strategic emphases and actions, the third addressed new product introduction and branding, the fourth firms' views on their competitive environment and the final section firms' views on actual events and possible future ones. Each interview took around 50 minutes and targeted the firms' marketing manager or person responsible for marketing and purchasing.

A commercial database of firms' contact details was purchased, with stratified sampling based on size (across size groups but excluding firms with less than 5 employees) and sector (just 8 sectors included), and across three stages of the marketing chain (retail, wholesale and processing). This sampling procedure yielded 986 firms, in many cases being the total number of eligible firms, given the stratified sample. After eliminating defunct firms, incorrect contact details, subsidiaries of other firms in the sample, telephone contacts were made with 444 firms. A telephone protocol was followed, and some 200 interviews were arranged. A team of 6 students were trained in all aspects of the survey from initial telephone contacts to detail of interview technique and data processing.

3.4. Data

The survey procedure[12] yielded 131 valid responses (a 30% response rate on 444 firms). The degree to which the survey is representative of the population of Danish food industry firms cannot be directly estimated, although table 2 below provides an

[11] The targeted firms were, by design, from non-farm stages of the marketing chain.
[12] Communications, logistics, training, data management and survey financing were all managed by student worker Anja Skadkær Møller.

overview. Eleven firms from the sectors "ingredients", "primary agriculture" and various "services" also appear in the survey dataset. These firms are classified by Statistics Danmark as being one of retailers, processors or wholesalers, but claim to operate at another stage of the chain.

The numbers of firms in the population (Statistics Denmark, 2006) includes firms with less than 5 employees, defunct firms, subsidiary firms and/or firms otherwise ineligible for the survey. Coverage rates range from the very low (8 unspecialised retail firms out of 3129 in the country) to quite large (9 of 39 fruit and vegetable processors, and 17 of 61 dairy processing plants (including ice cream manufacturers)). Many of the largest and best-known of Denmark's food industry firms participated in the survey.[13] Clearly, coverage and representativeness is greatest amongst processing firms, although sufficient wholesale and retail firms are included to allow some inference to be drawn.

Table 2. Numbers of firms: sample and population characteristics

	Numbers of firms							
	Processing		Retail		Wholesale		Other	
Commodity sector	Popn.	Survey	Popn.	Survey	Popn.	Survey	Popn.	Survey
Feed	43		na		na			1
Fruit and vegetables	39	9	556		219	2		1
Dairy	61	17	119		130	4		2
Beef	24	5	na		na			
Pork	26	3	na		na			
Poultry	8	3	na		na	1		2
Unspecialised meat	na	10	724	8	235	6		1
Unspecialised	na	7	3129	17	241	28		4

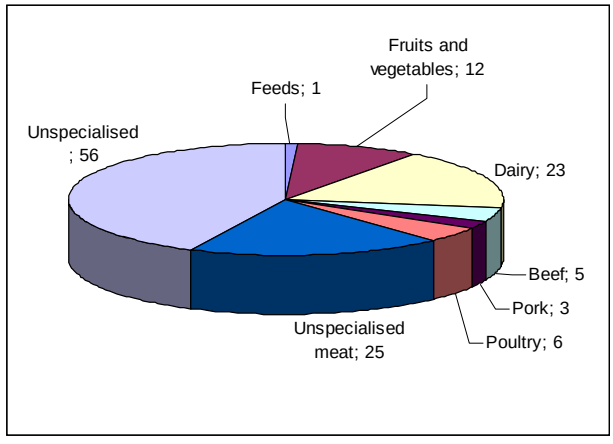
na not available.

3.5. Characteristics of responding firms

By design, firms in just 8 commodity sectors were surveyed, including "unspecialised" and "unspecialised meat", which together make up 81 firms of 131 (see figure 1).

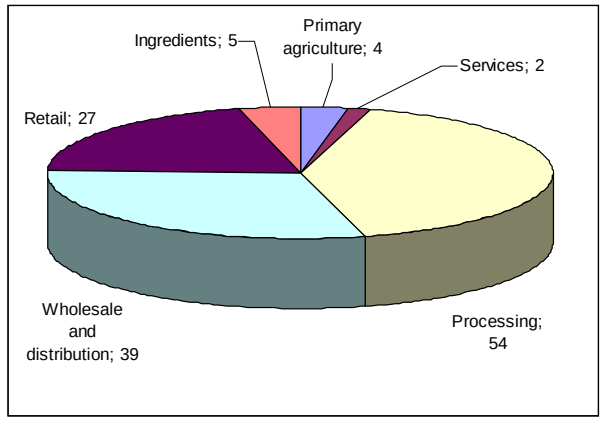
[13] Confidentiality precludes disclosure of firms' names, and detailed discussion of their sector and location.

Figure 1. Distribution of firms surveyed, by commodity sector



The survey addressed principally the non-farm stages of the food marketing chain, including services and ingredients. As seen in figure 2, processing, wholesale and distribution and retailing dominate the dataset.[14]

Figure 2. Distribution of firms surveyed, by stage of chain



[14] The four firms classified as primary agriculture are firms that describe themselves in that way despite having functions at other stages of the chain and being registered with commercial authorities in other stages of the chain.

Firms in the survey averaged annual sales of 812.5 million DKK and employed an average of 333.4 employees. Figures 3 and 4 display the firms' distributions according to revenue and labour force size classes. In both cases a reasonable cross-section of size classes was achieved.

Figure 3. Distribution of firms surveyed, by revenue size class

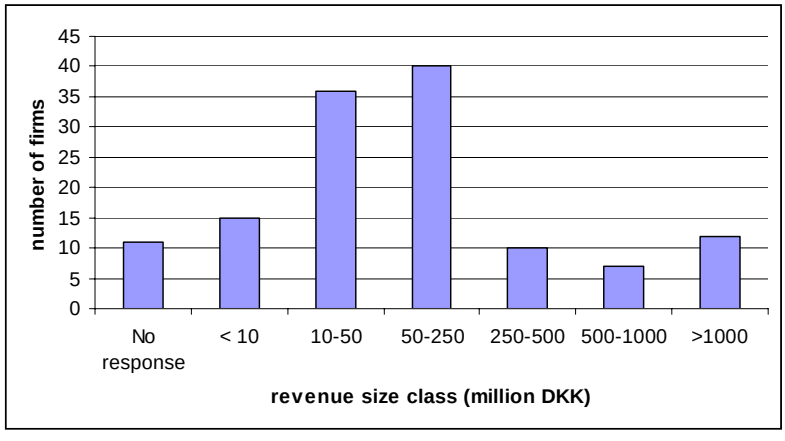
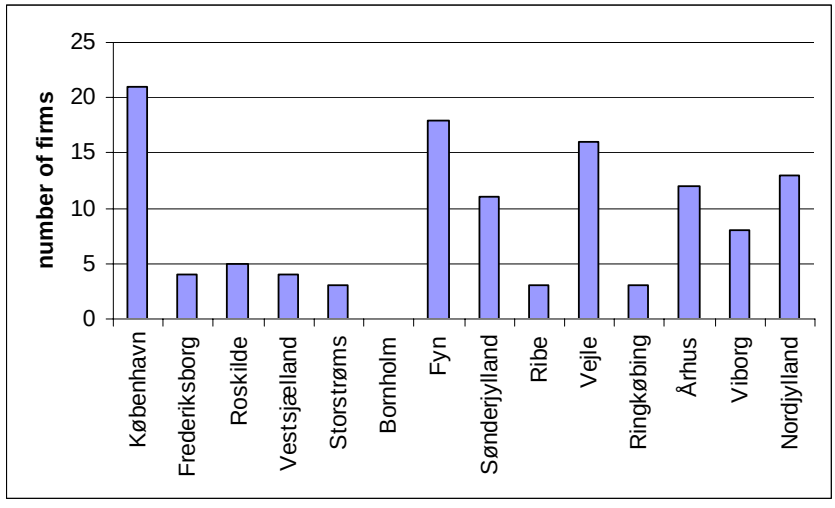


Figure 4. Distribution of firms surveyed, by employment size class

All regions of Denmark yielded at least 3 firms in the survey, with the exception of Bornholm, which yielded none (see figure 5).

Figure 5. Distribution of firms surveyed, by location



4. Numbers of trading partners

4.1. Numbers of suppliers

Surveyed firms reported the average number of suppliers of farm-based raw materials as just over 180 in 2000 (table 3). By 2005 this had declined 23% to about 139. It is notable that the maximum number of suppliers amongst survey firms declined by 24%, an even greater decline than the average. This decline is not statistically significant, probably due to the very large standard deviation[15] (which narrows between 2000 and 2005).

Table 3. Number of suppliers of farm-based raw materials

All firms	2000	2005	t-test
Average	180,1	138,9	ns
Minimum	0	0	
Maximum	14.500	11.000	
Std deviation	1357,8	992,8	

Key: ns not significant; * 10% level of test; ** 5% level of test; *** 1% level of test.

Table 4 reports the average number of suppliers for firms, divided according to size group. The decline in number of suppliers appears largest for the smallest and largest firms, with the 250-500 million DKK sales groups reporting zero change. It is notable that the only size group reporting statistically-significant change in suppliers was the 500-1000 million DKK group, and this group featured an average 22% increase in number of suppliers.

Table 4. Average number of suppliers of farm-based raw materials, by sales

Size group (million DKK sales)	2000	2005	% change	t-test
<10	5.7	4.6	-19%	ns
10-50	62.0	58.7	-5%	ns
50-250	36.7	35.2	-4%	ns
250-500	45.4	45.2	0%	ns
500-1000	65.5	80.2	22%	*
>1000	1770.2	1358.3	-23%	ns

Key: ns not significant; * 10% level of test; ** 5% level of test; *** 1% level of test.

[15] Due to the inclusion of some primary producers (claiming no suppliers at all) along with some very large firms (claiming a full supplier base).

Across stages of the marketing chain (table 5), food processors reported the largest decline in numbers of suppliers (32%) while ingredients producers reported a 24% increase. Too few ingredients' firms were included in the survey to justify a statistical test of this change. At other stages the average numbers of suppliers were little changed, although only wholesalers showed an increase (of 8%) in numbers of suppliers between 2000 and 2005.

Table 5. Average number of suppliers of farm-based raw materials, by stage

Stage of chain	2000	2005	% change	t-test
Primary	25.8	25.5	-1%	ns
Processing	369.2	252.3	-32%	***
Wholesale	86.2	93.3	8%	***
Retail	12.7	12.3	-3%	ns
Ingredients	37.0	46.0	24%	

Key: ns not significant; * 10% level of test; ** 5% level of test; *** 1% level of test.

When the data are subdivided by commodity sector, poultry processors are the only commodity-specialised firms that do not report a substantial decline in numbers of suppliers (table 6). The reported decline in suppliers to pork industry firms is very large, but involves too few firms for a statistical test.

Table 6. Average number of suppliers of farm-based raw materials, by sector

Sector	2000	2005	% change	t-test
Fruit and vegetables	54.6	43.1	-21%	**
Dairy	757.8	503.0	-34%	**
Beef	42.6	35.8	-16%	ns
Pork	428.5	239.7	-44%	
Poultry	50.0	51.2	2%	ns
Unspecialised meat	47.4	48.5	2%	**
Unspecialised	49.9	52.5	5%	ns

Key: ns not significant; * 10% level of test; ** 5% level of test; *** 1% level of test.

Finally, the survey responses on numbers of suppliers are subdivided by vertical integration status: inwards (where firms are partly- or wholly-owned by firms from other stages of the supply chain); outwards (where firms partly- or wholly-own firms at other stages of the chain); inwards and outwards (both); and no vertical integration (neither). Table 7 indicates that firms with "inward" vertical integration and "no vertical integration" have experienced a smaller decline in the number of suppliers than have firms with other vertical integration status.

Table 7. Average number of suppliers of farm-based raw materials, by vertical intrgration

Vertical integration status	Number of firms	2000	2005	% change	t-test
Vertical integration inwards	28	89.7	81.6	-9%	ns
Vertical integration outwards	25	760.6	563.0	-26%	**
Vertical integration inwards and outwards	5	3842.3	2924.5	-24%	
No vertical integration	83	42.4	40.5	-5%	ns

Key: ns not significant; * 10% level of test; ** 5% level of test; *** 1% level of test.

4.2. Numbers of buyers

Turning to the numbers of buyers reported by the surveyed firms, table 8 provides averages and other sample characteristics. In the remainder of this section, firms from the retail stage have been excluded, as consideration of the number of buyers refers to retail customers. After excluding retail firms, table 8's lower rows indicate a 10% decline from an average of 493 buyers to 441, although this is not statistically significant at levels of test below 10%. The maximum number of buyers reported has declined 30% and, as for firms' responses regarding sellers (table 8), there has been a significant narrowing in the standard deviation.

Table 8. Number of buyers

All firms[1]

	2000	2005	t-test
Average	493.5	441.4	ns
Minimum	1	1	
maximum	10000	7000	
std deviation	1529.2	1144.7	

1. Excludes retailers.
Key: ns not significant; * 10% level of test; ** 5% level of test; *** 1% level of test.

The smallest firms (retailers excluded) (see table 9) report a large decline in the number of buyers between 2000 and 2005, but firms with sales of 250 million DKK or more (again excluding retailers) report large increases.

Table 9. Average number of buyers, by sales

Size group (by million DKK sales)[1]	2000	2005	% change	t-test
<10	11.6	9.0	-22%	ns
10-50	99.1	131.9	33%	ns
50-250	424.4	336.4	-21%	ns
250-500	156.0	194.7	25%	ns
500-1000	1101.0	1702.0	55%	ns
>1000	1352.2	1518.8	12%	ns

1. Retail firms excluded.
Key: ns not significant; * 10% level of test; ** 5% level of test; *** 1% level of test.

Table 10 presents survey results on numbers of buyers, subdivided by stage of chain. Wholesale firms, on average, report an 11% decline in numbers of buyers, while ingredients suppliers report a statistically-significant 26% growth in numbers of buyers.

Table 10. Average number of buyers, by stage

Stage of chain[1]	2000	2005	% change	
Primary	50.3	47.3	-6%	ns
Processing	157.3	149.0	-5%	ns
Wholesale	908.5	807.2	-11%	ns
Ingredients	97.5	122.5	26%	**

1. Retail firms excluded.
Key: ns not significant; * 10% level of test; ** 5% level of test; *** 1% level of test.

Across sectors (see table 11), unspecialised firms (retailers excluded) report the greatest declines in numbers of buyers, while firms in the dairy and pork,[16] and unspecialised meat, sectors report large increases in the number of buyers.

[16] Results for the pork sector firms contain too few observations for a statistical test.

Table 11. Number of buyers, by sector

Sector[1]	2000	2005	% change	
Fruit and vegetables	113.4	115.2	2%	ns
Dairy	55.1	96.0	74%	**
Beef	124.6	121.8	-2%	ns
Pork	237.5	290.0	22%	
Poultry	105.3	100.2	-5%	ns
Unspecialised meat	84.2	115.3	37%	**
Unspecialised	1112.0	974.2	-12%	ns

1. Retail firms excluded.
Key: ns not significant; * 10% level of test; ** 5% level of test; *** 1% level of test.

Firms vertically-integrated "outwards" (i.e. those partly- or wholly-owning firms at different stages of the marketing chain) report a 25% decline in numbers of buyers, but other vertically-integrated firms report large increases. Firms with no vertical integration report a very slight decline in number of buyers (table 12).

Table 12. Number of buyers, by vertical integration

Vertical integration status[1]	2000	2005	% change	
Vertical integration inwards	79.5	120.9	52%	ns
Vertical integration outwards	1076.8	804.2	-25%	ns
Vertical integration inwards and outwards	162.3	270.0	66%	
No vertical integration	454.2	443.7	-2%	ns

1. Retail firms excluded.
Key: ns not significant; * 10% level of test; ** 5% level of test; *** 1% level of test.

4.3. Concentration amongst suppliers and buyers

Table 13 and 14 provide insight into the concentration amongst surveyed firms' suppliers and buyers. For 2000, surveyed firms reported an average of 180.1 suppliers (table 4.11). Of those 180.1 suppliers, just 14.8 suppliers on average sold 75% (by value) of the inputs purchased by firms. This means that just 8% of the suppliers supplied 75% of the firms' inputs. Between 2000 and 2005, the average total number of suppliers fell 23% to 138.9, as described above. The number of suppliers of 75% of inputs by value declined 12% in the same period. This means that between 2000 and 2005, concentration amongst suppliers eased slightly.

Table 13. Concentration in suppliers

All firms	2000	2005	% change	
Number of suppliers	180.1	138.9	-23%	
Number of suppliers supplying 75% of farm-based input, by value	14.8	13.0	-12%	ns
Proportion of sellers that are included in those selling 75% by value	8%	9%		

Key: ns not significant; * 10% level of test; ** 5% level of test; *** 1% level of test.

Table 14 examines the concentration amongst buyers (retail firms are excluded). Although the total number of buyers declined 11%, the number buying 75% (by value) of firms' output averaged an increase of 6%. In 2000, 32% of buyers purchased 75% of sales from these firms, and by 2005 this share had risen to 39% of buying firms. Table 14 indicates that, on the buying side, concentration has eased substantially.

Table 14. Concentration in buyers

All firms[1]	2000	2005	% change	
Number of buyers	493.5	441.4	-11%	
Number of buyers buying 75% of sales by value	160.3	170.7	6%	ns
Proportion of buyers that are included in those buying 75% by value	32%	39%		

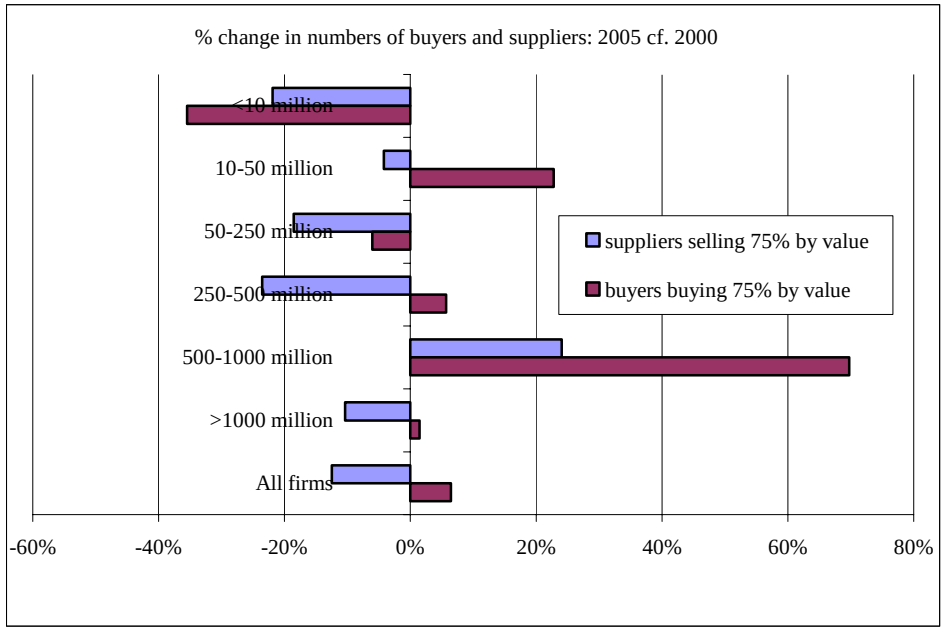
1. Firms from retail stage excluded.
Key: ns not significant; * 10% level of test; ** 5% level of test; *** 1% level of test.

Examination of the co-occurrence between concentration in firms' buying and selling sides yielded a statistically-insignificant correlation co-efficient of around 7%. This indicates few firm-specific determinants of concentration amongst trading partners.

Figures 6-8 present the surveyed firms' reported changes in concentration in numbers of buyers and sellers, disaggregated by firm size, stage of chain and commodity sector, respectively (it should be noted that retailers are excluded from the analysis of numbers of buyers).

Across most size groups, the number of suppliers selling 75% of inputs by value has declined, by 10-25%. The size interval 500-1000 million DKK is an exception, with an ensing of concentration in suppliers between 2000 and 2005. Aside from the smallest firms, buyer concentration has changed less between 2000 and 2005 than has seller concentration. Notably, two size groups report an average increase in the number of buyers buying 75% of sales, with firms in the 500-1000 million DKK group reporting an average increase of around 70% in the number of buyers buying 75% of sales.

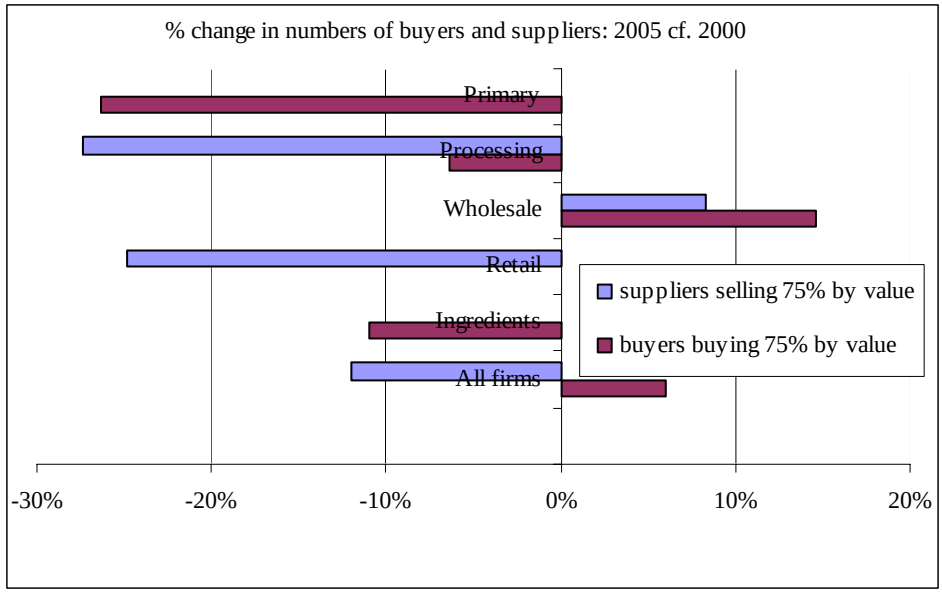
Figure 6. Change in concentration amongst buyers and sellers, by sales



Note: Firms from retail stage excluded from analysis of buyers.

Figure 7 presents the same data, disaggregated by stage of the food marketing chain. Processing firms and ingredients suppliers report large average declines in the number of buyers buying 75% of sales, while processors and retailers report large declines in numbers of suppliers selling 75% of inputs.

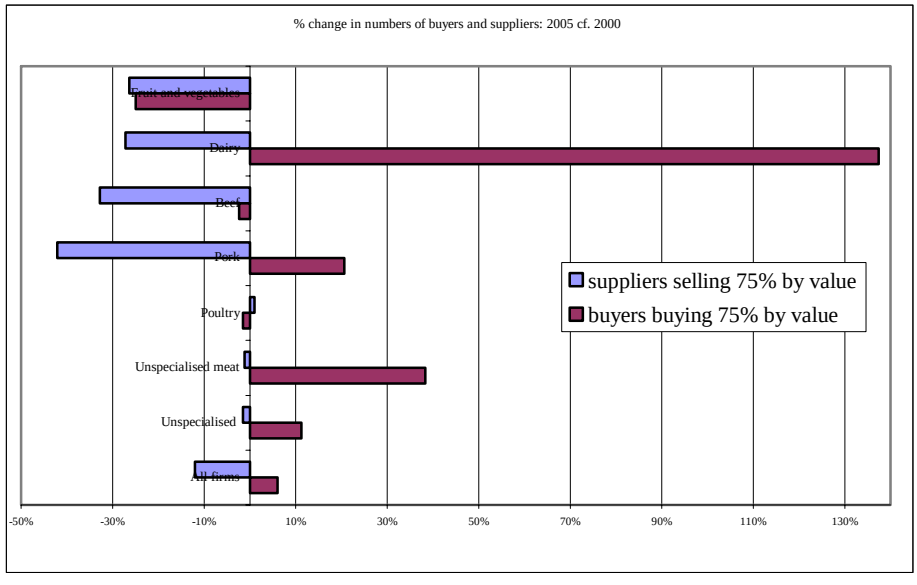
Figure 7. Change in concentration amongst buyers and sellers, by stage



Note: Firms from retail stage excluded from analysis of buyers.

By sector (figure 8), the results are dominated by a very large (140%) increase in numbers of buyers of 75% of sales by dairy-sector firms. Pork and unspecialised meat sector firms also report this easing of average concentration amongst buyers, albeit at less extreme levels. Across almost all sectors, concentration amongst suppliers became more pronounced while concentration amongst buyers has eased.

Figure 8. Change in concentration amongst buyers and sellers, by sector



Note: Firms from retail stage excluded from analysis of buyers.

5. Firms' views on market power

5.1. Possession of market power

In response to a question about the location of market power within the food marketing chain in both 2000 and 2005, around 70% of surveyed firms claimed that retail firms "hold the most market power" (table 15). The next most popular response was processors (about 15% of surveyed firms), while about 10% did not know. These proportions were unchanged between 2000 and 2005.

Table 15. % of all firms stating that each stage of the food chain holds the most market power

Stage of the food chain holding the most market power	2000	2005	
Retailers	70%	73%	ns
Distributors and/or wholesalers	5%	4%	ns
Processors	14%	16%	ns
Farmers	2%	2%	ns
Don't know/other	10%	8%	ns

Note: % do not add to 100% as several firms nominated more than stage
Key: ns not significant; * 10% level of test; ** 5% level of test; *** 1% level of test.

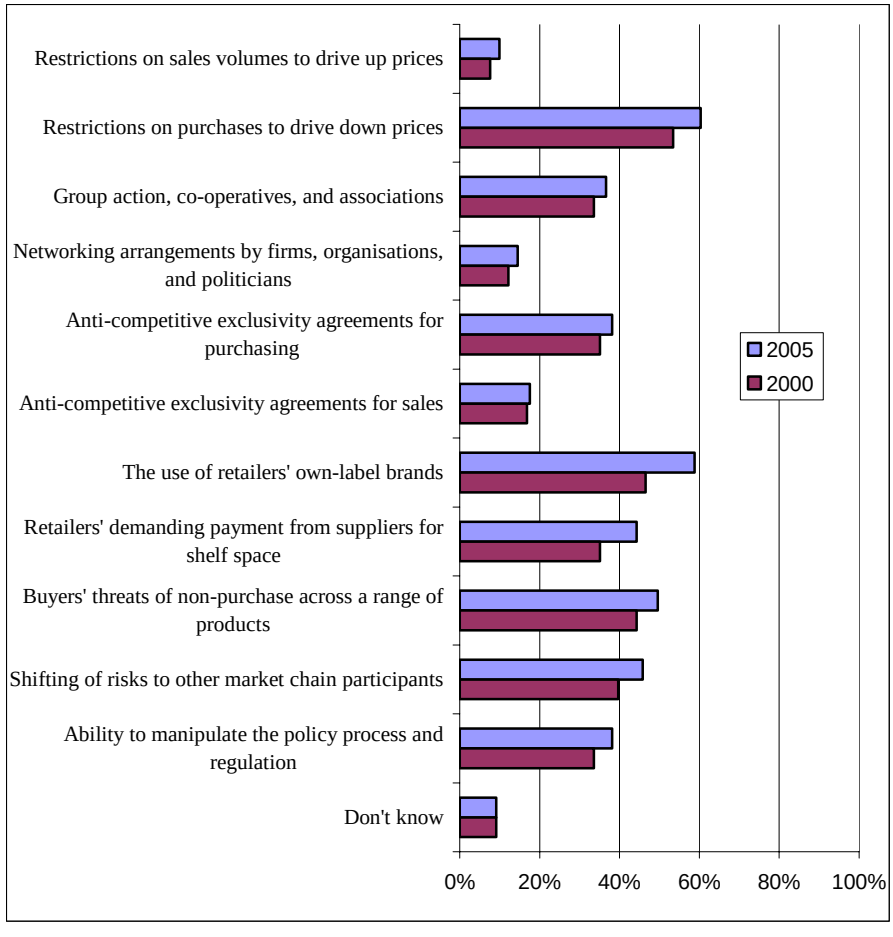
5.2. Exercise of market power

Firms' views on the instruments used to exercise market power are summarised in figure 9. Few surveyed firms reported traditional monopoly-type instruments (restrictions on sales volumes, exclusivity agreements for sales), but in sharp contrast about 60% reported monopsony-type actions by buyers (restricting purchases to drive down prices) and about 40% reported exclusivity agreements by purchasers. Other actions by buyers (demanding payment for access to shelf space, threat of non-purchase across a range of products) were also reported by 30-50% of surveyed firms. About half the surveyed firms reported "use of retailers' own-label brands" as an instrument in the exercise of market power.

Institutional arrangements were also identified by surveyed firms as means of exercising market power: group action (including co-operative action) was reported in this way by about 40% of firms, and 12% reported "networking arrangements by firms, organisations and politicians". On the same theme, about 40% of firms reported the "ability to manipulate the policy process" as an instrument of market power.

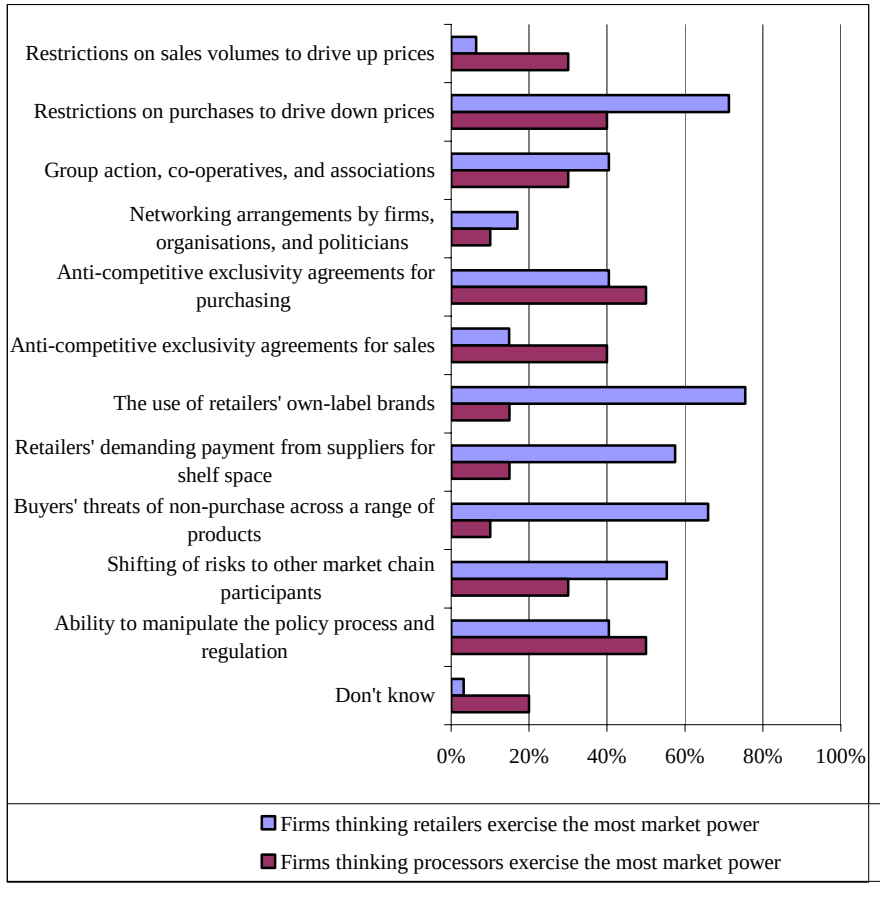
Some 40% of firms reported the "shifting of risk" within the food marketing chain as an instrument of market power, indicating the importance of actions beyond conventional monopoly and monopsony action. It is notable that most of the cited actions were claimed by similar numbers of surveyed firms for both 2000 and 2005, with the exception of retailers own-label brands, payments for access to shelf space ("slotting fees") and monopsony action to drive down prices.

Figure 9. Firms' views on the instruments used to exercise market power in the food chain



Surveyed firms' views on the instruments used to exercise market power in 2005 were very different, depending on the perceived location of the market power (see figure 10). Firms claiming that retailers possessed the most market power also claimed that retailers used such instruments as monopsony actions, retailers' own-label and within-chain pressures on suppliers. Firms that reported processors as the holders of the most market power identified monopoly actions, exclusivity agreements (for buying and selling), and the ability to manipulate the policy process. Notably, 20% of firms that nominated processors as the holders of market power did not know which instruments of market power processors were exercising.

Figure 10. Firms' impressions of the way in which market power is exercised, subdivided by the stage at which they believe market power to be held



Tables 16-19 disaggregate surveyed firms' statements about the exercise of market power by size (selected size classes only, table 16), stage of chain, sector, and vertical integration status. Small firms' responses (table 16) feature support for the view that market power is exercised in exclusivity agreements for purchasing (but not sales), buyers' threat of non-purchase and by powerful firms' ability to manipulate the policy process (53% of small firms). Large firms, in contrast, identified monopoly action, various actions by retailers (75% of large firms identified use of retailers' own-label), transfer of risks, and group action. Intermediate size categories (just two are shown here) tended to agree with larger firms about how market power was exercised, with perhaps more emphasis on monopsony action. In the 50-250 million DKK size class, fully 70% of firms identified the transfer of risk as an instrument of market power.

Table 16. Specific instrument of market power by sales

	Selected size group (million DKK sales)			
	<10	50-250	500-1000	>1000
Instrument of market power	% of firms stating that a specific instrument of market power is being used			
Restrictions on sales volumes to drive up prices	0%	8%	0%	17%
Restrictions on purchases to drive down prices	33%	68%	71%	50%
Group action, co-operatives, and associations	27%	45%	14%	50%
Networking arrangements by firms, organisations, and politicians	13%	20%	0%	25%
Anti-competitive exclusivity agreements for purchasing	40%	48%	14%	17%
Anti-competitive exclusivity agreements for sales	27%	18%	14%	0%
The use of retailers' own-label brands	33%	68%	71%	75%
Retailers' demanding payment from suppliers for shelf space	27%	50%	57%	50%
Buyers' threats of non-purchase across a range of products	47%	65%	29%	58%
Shifting of risks to other market chain participants	33%	70%	29%	50%
Ability to manipulate the policy process and regulation	53%	35%	43%	42%
Don't know	20%	5%	29%	8%

Note. Columns do not sum to 100%.

Across chain stages (table 17), there is reasonable agreement amongst firms about the use of instruments of market power. Just 48% of surveyed retail firms claimed that retailers' own-label brands were being used as an instrument of market power, compared to 61% of processors and 64% of wholesalers. Payments for access to shelf space ("slotting fees") were identified by just 35% of the processors surveyed, but by over half of both retailers and wholesalers surveyed. The stages also differed in their views about exclusivity.

Table 17. Specific instrument of market power by stage

	Stage of chain		
	Processing	Wholesale	Retail
Instrument of market power	% of firms stating that a specific instrument of market power is being used		
Restrictions on sales volumes to drive up prices	9%	8%	15%
Restrictions on purchases to drive down prices	61%	56%	59%
Group action, co-operatives, and associations	33%	36%	44%
Networking arrangements by firms, organisations, and politicians	17%	10%	15%
Anti-competitive exclusivity agreements for purchasing	43%	33%	33%
Anti-competitive exclusivity agreements for sales	13%	13%	33%
The use of retailers' own-label brands	61%	64%	48%
Retailers' demanding payment from suppliers for shelf space	35%	51%	52%
Buyers' threats of non-purchase across a range of products	52%	44%	52%
Shifting of risks to other market chain participants	50%	41%	44%
Ability to manipulate the pollicy process and regulation	37%	36%	41%
Don't know	9%	10%	11%

Note. Columns do not sum to 100%.

Table 18 presents the same data, disaggregated by sector. Surveyed firms from different sectors generally agree on the use/non-use of monopoly and monopsony instruments, threats of non-purchase across a range of items, use of retailers' own-label, risk transfer and the ability to manipulate policy. Wide disparities are observed concerning the use of group action, exclusivity agreements, collusion and networking agreements. It is notable that significant proportions of surveyed pork and dairy firms expressed the view that group action was being exercised as an instrument of market power, while no surveyed poultry sector firms expressed this view.

Table 18. Specific instrument of market power by sector

Instrument of market power	Sector						
	Fruit and vegetables	Dairy	Beef	Pork	Poultry	Unspecialised meat	Unspecialised
	% of firms stating that a specific instrument of market power is being used						
Restrictions on sales volumes to drive up prices	8%	4%	20%	33%	17%	8%	11%
Restrictions on purchases to drive down prices	58%	65%	60%	100%	67%	52%	59%
Group action, co-operatives, and associations	17%	35%	40%	67%	0%	44%	39%
Networking arrangements by firms, organisations, and politicians	25%	22%	0%	33%	17%	8%	13%
Anti-competitive exclusivity agreements for purchasing	17%	39%	60%	67%	33%	52%	32%
Anti-competitive exclusivity agreements for sales	0%	17%	0%	67%	0%	24%	18%
The use of retailers' own-label brands	58%	65%	40%	67%	33%	44%	66%
Retailers' demanding payment from suppliers for shelf space	17%	43%	40%	33%	33%	20%	63%
Buyers' threats of non-purchase across a range of products	50%	52%	60%	33%	50%	32%	55%
Shifting of risks to other market chain participants	42%	35%	40%	67%	33%	48%	52%
Ability to manipulate the pollicy process and regulation	42%	30%	40%	33%	17%	40%	41%
Don't know	8%	4%	0%	0%	0%	16%	11%

Note. Columns do not sum to 100%.

Firms that reported vertical integration both inward and outward reported views on the exercise of market power that are somewhat different from those of firms reporting other vertical integration status (see table 19). Inward-and-outward integrated firms particularly identified use of retailers' own-label brands, but not monopoly and monopsony actions, and not group action. They also showed less support for claims of retailers' use of slotting fees than did the other firms.

Table 19. Specific instrument of market power by vertical integration

	Vertical integration status			
Instrument of market power	Vertical integration inwards	Vertical integration outwards	Vertical integration inwards and outwards	No vertical integration
	% of firms stating that a specific instrument of market power is being used			
Restrictions on sales volumes to drive up prices	4%	4%	0%	13%
Restrictions on purchases to drive down prices	57%	56%	40%	61%
Group action, co-operatives, and associations	43%	32%	20%	35%
Networking arrangements by firms, organisations, and politicians	21%	28%	40%	10%
Anti-competitive exclusivity agreements for purchasing	36%	40%	40%	39%
Anti-competitive exclusivity agreements for sales	7%	12%	0%	22%
The use of retailers' own-label brands	64%	68%	80%	55%
Retailers' demanding payment from suppliers for shelf space	36%	44%	20%	46%
Buyers' threats of non-purchase across a range of products	46%	48%	40%	51%
Shifting of risks to other market chain participants	46%	48%	40%	45%
Ability to manipulate the pollicy process and regulation	43%	40%	40%	36%
Don't know	4%	8%	0%	11%

Note. Columns do not sum to 100%.

5.3. New products and market power

Firms were asked to identify barriers to new product introduction from a list of potential barriers drawn from the literature,[17] presented as "statements". Three such statements of potential barriers concerned competitive conditions within the food marketing chain (see table 20). Comparatively few firms identified these potential barriers as "major barriers to new product development and introduction", but in each case there were statistically significant increases in the numbers during so.

Table 20. % of firms reporting major barrier to new product development and introduction

Statement	2000	2005	
	% of firms agreeing with statement		χ^2-test
The small number of retail firms restricts the demand for new products	16%	19%	**
Retailers' own-label brands restrict access by this firm's new products	13%	17%	*
Buyers pass many introduction costs to this firm	14%	18%	**

[17] See Baker (2007) for a detailed summary of survey results.

5.4. Views on antimonopoly legislation

Surveyed firms interpret "stricter anti-monopoly regulation" as neither an opportunity nor a threat (see table 21). 9% of firms viewed such a development as a "great opportunity" and only 6% viewed it as a threat of any kind. On average, the score was 0.3, or just slightly towards the "opportunity" end of the spectrum.

Table 21. Firms' views on implications of stricter antimonopoly regulation

	Firms' views on the implications of stricter anti-monopoly regulation in the future					
Score:	-2	-1	0	1	2	mean score
Interpretation	(serious threat)		(neither opportunity nor threat)		(great opportunity)	
% of firms	0%	6%	67%	17%	9%	0%
	Event interpreted as a threat and/or opportunity to the firm: mean score all firms					
Stricter anti-monopoly regulation				0.30		

There was some variation around this average score (0.3) according to surveyed firms' size, stage of chain, commodity sector, and vertical integration status (results not shown here). A somewhat counter-intuitive result is that larger firms view stricter anti-monopoly regulation as more of an opportunity (an average score of 0.5) than did smaller firms (0.27).

6. Contracts

6.1. Use of contracts

Some 78% of surveyed firms claimed to use written contracts in 2005, but the coverage of transactions by contracts differed by transaction type, and the distribution differed somewhat between 2000 and 2005. Surveyed firms reported that a considerably higher proportion of transactions for "food and farm-based purchases" employed contracts than did other input purchases.

Table 22's results are subdivided into (i) all surveyed firms and (ii) firms using contracts. Part (ii)'s results show that the average proportion of transactions using contracts was higher for farm and food-based purchases than for the other transactions listed. Moreover, across all categories of transaction listed, the proportion employing contracts increased significantly. The increase in the farm/food-based purchases was the largest of all.

Table 22. Transactions covered by written contracts, all firms

	2000	2005	
(i) Average % of transactions by all firms	% of transactions covered by written contracts		
farm/food-based purchases	46%	51%	
other input purchases	25%	26%	
sales to retailers	28%	31%	
sales to wholesalers/distributors	28%	32%	
% of all firms using contracts in 2005	78%		
(ii) Average % of transactions by firms using contracts	2000	2005	t-test
farm/food-based purchases	58%	64%	***
other input purchases	31%	33%	***
sales to retailers	35%	40%	***
sales to wholesalers/distributors	36%	41%	**

non-responses included in "not using contracts".
Key: ns not significant; * 10% level of test; ** 5% level of test; *** 1% level of test.

Amongst surveyed firms using contracts, the bias toward written contracts for food and farm-based inputs is most extreme for smaller size classes of surveyed firms (see table 23). Conversely, amongst larger firms the majority of transactions within the food chain (e.g. sales to retailers) are covered by written contracts, while this is not the case for smaller firms.

Table 23. Transactions covered by contracts by sales

	Size group (million DKK sales)					
	<10	10-50	50-250	250-500	500-1000	>1000
Transaction type	% of transactions covered by written contracts					
farm/food-based purchases	90%	61%	65%	62%	44%	64%
other input purchases	14%	15%	31%	68%	42%	71%
sales to retailers	40%	14%	44%	23%	54%	78%
sales to wholesalers/distributors	38%	24%	37%	71%	51%	59%

Note: Only firms using contracts.

There are few apparent differences between processing, wholesale and retail firms in their use of contracts (table 24). Across these three stages, contracts are more commonly used for transactions for food and farm-based products than for other inputs, and a minority of sales to retailers, and wholesalers and distributors, are covered by written contracts.

Table 24. Transactions covered by contracts by stage

	Stage of chain		
	Processing	Wholesale	Retail
Transaction type	% of transactions covered by written contracts		
farm/food-based purchases	62%	52%	76%
other input purchases	32%	30%	34%
sales to retailers	46%	43%	
sales to wholesalers/distributors	45%	33%	

Note: Only firms using contracts.

Firms in the dairy, poultry and fruits and vegetables sectors report using written contracts for purchases of food and farm-based inputs to a far greater extent than do firms in other sectors (table 25). Across most sectors, a minority of other transactions use written contracts.

Table 25. Transactions covered by contracts by sector

	Sector						
	Fruit and vegetables	Dairy	Beef	Pork	Poultry	Unspecialised meat	Unspecialised
Transaction type	% of transactions covered by written contracts						
farm/food-based purchases	74%	85%	0%	73%	82%	45%	63%
other input purchases	36%	49%	8%	30%	13%	20%	36%
sales to retailers	32%	40%	36%	38%	35%	31%	47%
sales to wholesalers/distributors	46%	56%	0%	38%	33%	27%	46%

Note: Only firms using contracts.

Vertically-integrated firms report using written contracts to a greater extent than do non-vertically-integrated firms (table 26). For all transactions involving input purchases (food and farm-based and others) inward- and outward-integrated firms report greater use of contracts than the other categories of firm. Firms vertically integrated "inwards" report relatively few transactions with retailers and wholesalers being covered by contracts, but at similar levels to non-vertically-integrated firms.

Table 26. Transactions covered by contracts by vertical integration

	Vertical integration status			
	Vertical integration inwards	Vertical integration outwards	Vertical integration inwards and outwards	No vertical integration
Transaction type	% of transactions covered by written contracts			
farm/food-based purchases	68%	67%	88%	63%
other input purchases	49%	44%	55%	24%
sales to retailers	37%	64%	54%	35%
sales to wholesalers/distributors	33%	66%	51%	38%

Note: Only firms using contracts.

6.2. Length of contracts

Firms were asked about changes in the length of their contracts, but few (18% of the sample) responded to this question. All responding firms reported that contracts had become "longer" in the period 2000-2005.

6.3. Content of contracts

Firms using written contracts report some substantial changes in the content of contracts between 2000 and 2005 (table 27). There was an increase in incidence of almost all contract items proposed in the questionnaire. The largest changes include food safety (up from 49 to 67% of firms specifying this item in their contracts between 2000 and 2005 respectively) and the provision of information enabling traceability and quality assessment.

There is some evidence of transfer of physical and logistic tasks and responsibilities between chain stages. 12% of firms report that in 2005 contracts included stocking of shelves, up from just 7% in 2000, and for delivery to the buyer the increase has been from 48 to 62% of firms. Responsibility for packaging has apparently also become more common in contracts. There has been a small increase in the extent to which advertising and promotion responsibilities have been included in written contracts used by surveyed firms, but contracts' treatment of failed and unsold products seems to have changed little. A further noteworthy result is the increase in appearance of public liability items in written contracts.

Table 27. Content of contracts for all firms using contracts

Contract item for which responsibility is assumed	2000	2005	
	% of firms reporting this item in contracts		χ^2-test
Food safety	49%	67%	***
Information enabling product traceability	42%	63%	***
Selecting the standard to be used in the quality specification	30%	42%	***
Accuracy of quality information	46%	57%	***
Packaging	41%	54%	***
Delivery to buyer	48%	62%	***
Stocking of shelves	7%	12%	**
Refunds to the buyer for unsold products	12%	12%	ns
Compensating the buyer for failed new products	9%	12%	*
Advertising of new products	35%	35%	ns
Advertising of non-new products	27%	35%	***
The costs of promotions and promotional price reductions	25%	34%	***
Insurance during transport and warehousing	44%	55%	***
Public liability insurance	46%	60%	***

Key: ns not significant; * 10% level of test; ** 5% level of test; *** 1% level of test.

Table 28 presents information about the allocation of responsibility for selected contract items across stages of the chain in 2005. A large majority of processing and wholesale firms report assuming responsibility for food safety, information regarding traceability and quality, transport and delivery, and public liability; and these results differ sharply from those reported by retailers.

Table 28. Contents of contracts, by stage of chain

	Stage of chain		
	Processing	Wholesale	Retail*
Contract item for which responsibility is assumed in 2005	% of firms that in the sales* contracts assume responsibility for:		
Food safety	71%	69%	47%
Information enabling product traceability	60%	72%	47%
Selecting the standard to be used in the quality specification	43%	44%	32%
Accuracy of quality information	62%	59%	37%
Packaging	62%	59%	21%
Delivery to buyer	64%	72%	32%
Stocking of shelves	12%	13%	16%
Refunds to the buyer for unsold products	10%	16%	11%
Compensating the buyer for failed new products	14%	16%	5%
Advertising of new products	33%	31%	53%
Advertising of non-new products	31%	38%	47%
The costs of promotions and promotional price reductions	38%	28%	42%
Insurance during transport and warehousing	60%	75%	5%
Public liability insurance	62%	69%	37%

* For retail firms the contracts are purchase contracts.

When the same survey information is disaggregated by commodity sector (table 29), a number of differences appear. Fruits and vegetables and pork industry firms overwhelmingly claim not to assume responsibility for food safety in their sales contracts, whereas the opposite is true for all other sectors. Substantial variation amongst sectors exists for contract items such as information provision, promotion of new products and public liability.

Table 29. Contents of contracts, by sector

	Sector						
	Fruit and vege-tables	Dairy	Beef	Pork	Poultry	Unspecialised meat	Unspecialised
Content of contracts 2005	% of firms that in the sales contracts assume responsibility for:						
Food safety	50%	67%	75%	50%	83%	69%	67%
Information enabling product tracea-bility	50%	67%	75%	0%	67%	69%	63%
Selecting the standard to be used in the quality specification	42%	33%	50%	50%	33%	38%	46%
Accuracy of quality information	58%	40%	75%	50%	83%	63%	54%
Packaging	58%	60%	50%	50%	17%	50%	57%
Delivery to buyer	58%	53%	50%	50%	83%	56%	65%
Stocking of shelves	8%	0%	0%	0%	0%	25%	15%
Refunds to the buyer for unsold products	8%	13%	25%	0%	0%	0%	17%
Compensating the buyer for failed new products	8%	27%	25%	0%	0%	6%	11%
Advertising of new products	33%	13%	25%	50%	17%	44%	41%
Advertising of non-new products	33%	7%	25%	50%	17%	50%	41%
The costs of promotions and promo-tional price reductions	17%	33%	25%	50%	33%	38%	37%
Insurance during transport and ware-housing	42%	53%	75%	50%	67%	63%	52%
Public liability insurance	42%	47%	75%	50%	67%	69%	63%

Note: For retail firms the contracts are purchase contracts.

7. Retailers' own-label brands

7.1. Use of retailers' own-label brands

Some 42% of surveyed firms sold retailers' own-label brands in 2005 (see table 30), which is a statistically-significant increase on 2000's figure (33%). Across all firms, just 7-8% of revenues were derived from such sales, but amongst the firms selling retailers' own-label brands the share of sales was about 20% and unchanged between 2000 and 2005.

Table 30. Use of retailers' own-label brands

All firms	2000	2005	χ^2-test
% of firms that sell retailers own label brands	33%	42%	**
Average % of sales from retailers' own-label brands			t-test
Sellers of retailers' own-label brands	21%	20%	ns
All firms	7%	8%	

Key: ns not significant; * 10% level of test; ** 5% level of test; *** 1% level of test.

7.2. Impressions of retailers' own-label brands

Over 60% of surveyed firms claimed not to know the impacts of retailers' own-label brands (see table 31) on their own operations. Amongst firms providing an opinion, a strong majority (33% compared to 5%) claimed that they are less profitable than the firms' brands. Qualified majorities also claimed that retailers' own-label brands helped utilise spare capacity and were complementary to (rather than competing with) the firms' brands. Qualified majorities rejected the idea that commercial information was exchanged. "Overall", 31% of surveyed firms reported retailers' own-label brands to be "a positive thing for the firm", against just 7% claiming the opposite.

Table 31. All firms' impressions of the impacts of r.o.l.b.

	Yes	No	Don't know
Are retailers' own label brands and accompanying contracts…		% of firms	
competing with the firm's brands?	22%	18%	60%
complementary to the firm's brands?	24%	15%	61%
a good way of utilising spare production capacity?	25%	13%	62%
a good way of receiving information from retailers?	15%	22%	63%
a good way of giving commercial information to retailers?	14%	21%	65%
more profitable than the firm's brands?	5%	33%	63%
overall, a positive thing for the firm?	31%	7%	63%

Small firms answered "don't know" to all questions about the impacts of retailers' own-label brands (table 32), whereas for the largest firms one third to one half of firms answered this way. Amongst the larger firms there is reasonable consistency in assessment. By similar margins, firms in all size classes agree that retailers' own-label brands are a positive thing overall, but differ somewhat in the assessment of their profitability relative to firms' brands. Notably, majorities of the largest firms claim that retailers' own-label brands are both competitive with, and complementary to, the firms' brands: this result is probably due to these largest firms' involvement with multiple brands of both types. In the 500-1000 million DKK sales category, 43% of firms report that retailers' own-label brands are competing with their brands and just 29% claimed that they are complementary.

Table 32. Impressions of the impacts of r.o.l.b., by size

	Size group (million DKK sales)					
	<10			50-250		
	Yes	No	Don't know	Yes	No	Don't know
Are retailers' own label brands and accompanying contracts…	% of firms					
competing with the firm's brands?	0%	0%	100%	18%	35%	48%
complementary to the firm's brands?	0%	0%	100%	35%	18%	48%
a good way of utilising spare production capacity?	0%	0%	100%	38%	15%	48%
a good way of receiving information from retailers?	0%	0%	100%	18%	35%	48%
a good way of giving commercial information to retailers?	0%	0%	100%	20%	30%	50%
more profitable than the firm's brands?	0%	0%	100%	5%	48%	48%
overall, a positive thing for the firm?	0%	0%	100%	43%	8%	50%
	500-1000			>1000		
	Yes	No	Don't know	Yes	No	Don't know
Are retailers' own label brands and accompanying contracts…	% of firms					
competing with the firm's brands?	43%	14%	43%	67%	0%	33%
complementary to the firm's brands?	29%	14%	57%	58%	8%	33%
a good way of utilising spare production capacity?	29%	14%	57%	50%	8%	42%
a good way of receiving information from retailers?	14%	29%	57%	17%	42%	42%
a good way of giving commercial information to retailers?	29%	14%	57%	25%	33%	42%
more profitable than the firm's brands?	0%	43%	57%	17%	33%	50%
overall, a positive thing for the firm?	43%	14%	43%	50%	8%	42%

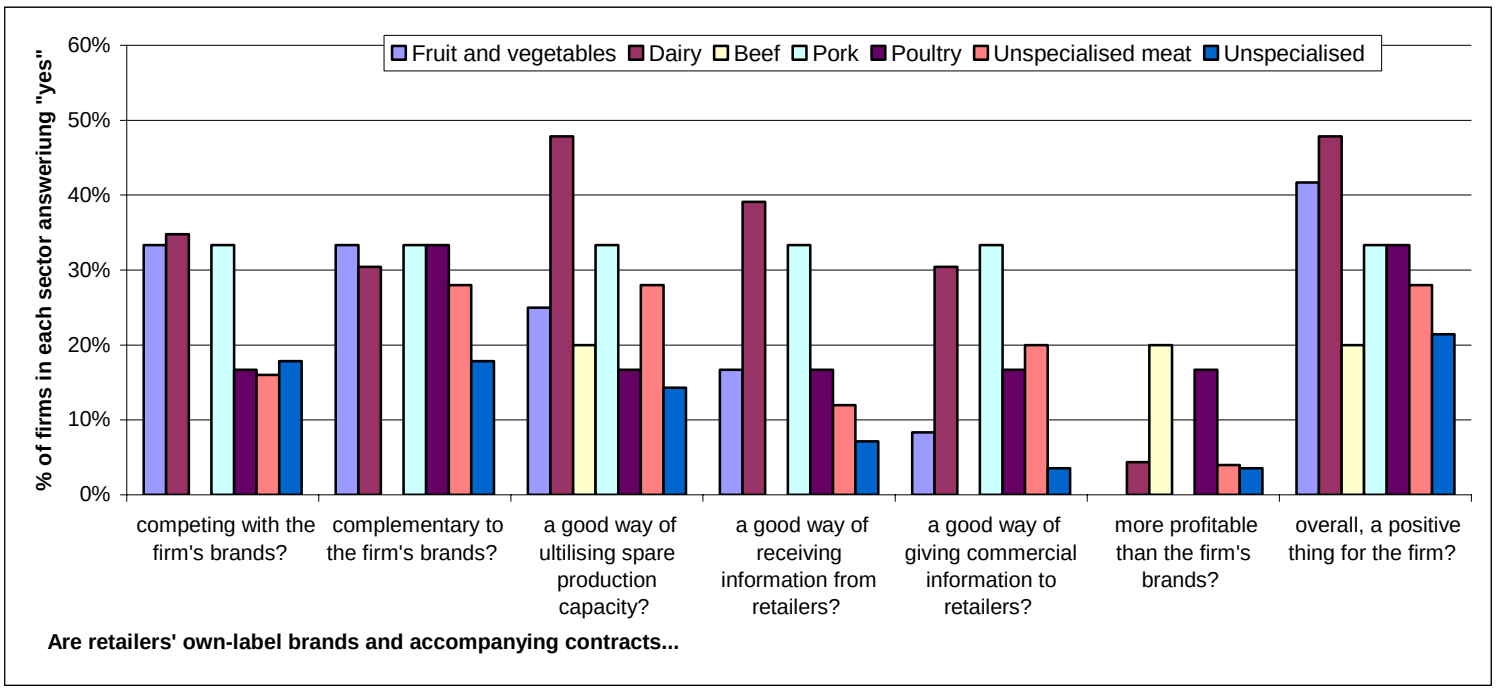
Amongst stages of the chain, about one third of processors answered "don't know", compared to two thirds of wholesalers (table 33). There is substantial agreement between firms in the two stages presented here on the impacts of retailers' own-label brands, with the exception of the utilisation of capacity and the exchange of information with retailers: a substantial share of processing firms acknowledged the information exchange role of retailers' own-label brands.

Table 33. Impressions of the impacts of r.o.l.b., by stage

	Stage of chain					
	Processing			Wholesale/ distribution		
	% of firms					
Are retailers' own label brands and accompanying contracts…	Yes	No	Don't know	Yes	No	Don't know
competing with the firm's brands?	33%	30%	37%	23%	15%	62%
complementary to the firm's brands?	35%	26%	39%	28%	10%	62%
a good way of utilising spare production capacity?	48%	13%	39%	13%	23%	64%
a good way of receiving information from retailers?	30%	28%	43%	10%	28%	62%
a good way of giving commercial information to retailers?	24%	31%	44%	10%	23%	67%
more profitable than the firm's brands?	6%	54%	41%	8%	28%	64%
overall, a positive thing for the firm?	48%	11%	41%	33%	5%	62%

Figure 11 presents firms' responses by commodity sector (for presentational clarity, just the "yes" responses). In general, dairy firms are more positive about retailers' own-label brands than those in other sectors. Few firms from any sector report that retailers' own-label brands are more profitable than the firms' brands, but 20-40% of firms in all sectors agree that there is a benefit from improved capacity utilisation. Firms in poultry and unspecialised sectors appear less concerned about competing brands than those in other sectors, while there is a range of reported impacts on information sharing. Firms in fruits and vegetables and dairy sectors are more inclined than those in other sectors to report that retailers' own-label brands are a positive thing "overall".

Figure 11. Firms' impressions of retailers' own-label brands, by sector of responding firm



Firms vertically integrated both inwards and outwards are, proportionately, far more supportive of retailers' own-label brands than are other firms.

Table 34. Impressions of the impacts of r.o.l.b., by vertical integration

	Vertical integration status					
	Vertical integration inwards			Vertical integration outwards		
	% of firms					
Are retailers' own label brands and accompanying contracts…	Yes	No	Don't know	Yes	No	Don't know
competing with the firm's brands?	32%	29%	39%	32%	20%	48%
complementary to the firm's brands?	39%	21%	39%	36%	12%	52%
a good way of utilising spare production capacity?	39%	21%	39%	28%	16%	56%
a good way of receiving information from retailers?	25%	36%	39%	20%	28%	52%
a good way of giving commercial information to retailers?	25%	29%	46%	24%	16%	60%
more profitable than the firm's brands?	0%	61%	39%	4%	40%	56%
overall, a positive thing for the firm?	46%	11%	43%	44%	4%	52%

	Vertical integration inwards and outwards			No vertical integration		
	% of firms					
Are retailers' own label brands and accompanying contracts…	Yes	No	Don't know	Yes	No	Don't know
competing with the firm's brands?	80%	20%	0%	19%	13%	67%
complementary to the firm's brands?	80%	20%	0%	19%	13%	67%
a good way of utilising spare production capacity?	80%	20%	0%	23%	10%	67%
a good way of receiving information from retailers?	80%	20%	0%	14%	16%	70%
a good way of giving commercial information to retailers?	60%	20%	20%	10%	20%	70%
more profitable than the firm's brands?	0%	100%	0%	6%	25%	69%
overall, a positive thing for the firm?	80%	0%	20%	24%	6%	70%

Finally, table 35 presents firms' views on the impact of retailers' own-label brands, disaggregated by whether or not firms actually use retailers' own-label brands. The great majority of firms not using retailers' own-label brands respond "don't know" to most questions. Amongst firms that do use retailers' own-label brands, there is an overall positive evaluation of retailers' own-label brands but an emphatic statement (62% answering "no") that firms are less profitable than firms' brands.

Table 35. Impressions of the impacts of r.o.l.b., by use of r.o.l.b.

	Use of r.o.l.b. status					
	Users of r.o.l.b.			Non-users of r.o.l.b.		
	% of firms					
Are retailers' own label brands and accompanying contracts…	Yes	No	Don't know	Yes	No	Don't know
competing with the firm's brands?	40%	35%	25%	4%	4%	91%
complementary to the firm's brands?	49%	25%	25%	3%	6%	91%
a good way of utilising spare production capacity?	53%	25%	27%	4%	6%	91%
a good way of receiving information from retailers?	27%	20%	29%	3%	4%	91%
a good way of giving commercial information to retailers?	27%	40%	33%	1%	7%	91%
more profitable than the firm's brands?	9%	62%	29%	1%	7%	91%
overall, a positive thing for the firm?	62%	9%	29%	3%	4%	93%

8. Discussion and Conclusions

8.1. Overview

This study employs a recent survey of firms' views to examine trends in competitive structures and practices in the Danish food industry. Based on prevailing theory and known recent trends in aggregate data, hypotheses were formed and tested (see table 36). Overall, there is weak evidence of firms' having experienced narrowing food marketing chains and increasingly concentrated sales and purchasing channels in the period 2000-2005. However, firms' views and claimed actions on transactions and competition have changed substantially in this period. This is particularly pronounced in use and content of contracts, views on market power, attitudes to retailers' own-label and adopted practices such as vertical integration. This paper provides some evidence to suggest that sector-, commodity- and size-specific concerns exist for firms regarding competition and transactions in the Danish food marketing chain.

Amongst surveyed firms, the average reported number of suppliers fell by 23% between 2000 and 2005 while the average number of buyers[18] fell about 10%. Falls in the numbers of suppliers were greatest for the very smallest and very largest firms, while medium-sized to large firms (500-1000 million DKK in sales) reported an increase of 23% in the number of buyers. The smallest firms also reported the largest fall in the number of buyers, although results were mixed amongst size classes. Processors, and firms in most specialised commodity sectors, reported the greatest declines in number of suppliers. Owing to large sample variances, few statistically-significant results emerge.

Most (non-retail) stages of the food marketing chain reported a 5-10% decline in number of buyers between 2000 and 2005. These changes were pronounced amongst unspecialised firms: commodity-specialised firms generally reported an increase in the number of buyers. Firms with no vertical integration report a slight reduction in both suppliers and buyers. The relationship between vertical integration and buyers and sellers offers little insight: all vertically integrated firms report a reduction in numbers of suppliers but only those vertically-integrated "outwards" (owning shares in firms at different points in the chain) report declines in the number of buyers.

[18] Measures of the number of buyers exclude retail firms, for whom buyers are retail customers.

Table 36. Overview of hypotheses tested

	Topic	Hypotheses	Result
1	Numbers of sellers	• Decline 2000-2005	• Average numbers of suppliers and buyers have declined, but results are, for the most part, statistically insignificant. • Processing firms, dairy and fruit & veg. sector firms, and vertically-integrated (outwards) firms reported declines in seller numbers that were statistically significant. • Large firms, wholesalers and unspecialised meat sector firms report increases in numbers of sellers that are statistically significant. • No dis-aggregation of firms revealed a pattern of statistically-significant decline in numbers of buyers between 2000 and 2005. Dairy and unspecialised meat sector firms reported large increases that were statistically significant.
2	Numbers of buyers	• Decline 2000-2005	
3	Concentration in trading partners	• Currently high • More intense 2000-2005	• Concentration amongst suppliers is higher in 2005 than is concentration amongst buyers. • Concentration amongst both suppliers and buyers has become less intense between 2000 and 2005, although the result varies across types of firm.
4	Firms' views on location of market power	• Most firms identify retailers	• 73% of firms identified retailers as holding the most market power; 16% identified processors. Views largely unchanged between 2000 and 2005.
5	Form of market power exercised	• Changes in form 2000-2005 • Differ depending on location of the market power • Differ depending on the type of firm making the claim • Many firms will claim to experience within-chain instruments (e.g. slotting fees, shifts of risk), rather than conventional monopoly-monopsony action	• Firms' views indicate only slight changes in form between 2000 and 2005. • Firms identifying retailers as holding the market power claim that market power takes the form of buyer-side (monopsony) pressure and within-chain activities including use of retailers' own-label. • Firms identifying processors as holding the market power claim that exclusive dealing and manipulation of the policy process are the main forms of market power used, along with monopsony action. • Firms' views differ according to size, stage of chain, sector and vertical integration practice.

Table 36. (Continued) Overview of hypotheses tested

	Topic	Hypotheses	Result
6	Contracts	• Food treated differently to other purchases • More widely used 2000-2005 • Longer 2000-2005 • Contracts changed in content 2000-2005 • Usage differs amongst types of firm • Content differs amongst types of firm	• Transactions for farm/food based purchases more frequently (64% of transactions) than do transactions for other purposes (30-40%). • All transactions were more likely to use written contracts in 2005 than in 2000. The rate of increase was highest for farm/food based transactions. • No conclusion drawn on length of contracts. • Content of contracts has changed markedly between 2000 and 2005. Food safety as a contract item is reported by 67% of firms in 2005, c.f. just 49% in 2000. Information provision, quality assurance and public liability all showed large increases in incidence in contracts. Within-chain actions (slotting fees, promotions costs) are not widely reported and generally have not grown in incidence between 2000 and 2005. • Content of contracts differs very widely amongst types of firm.
7	New product development	• Firms will claim that market power is a significant constraint	• Few firms view market power as a constraint. • The number of firms with this view increased slightly (but statistically significantly) between 2000 and 2005.
8	"Stricter anti-Monopoly policy"	• Large firms view this as a threat, smaller firms as an opportunity	• 67% of firms view "stricter anti-monopoly policy" as neither an opportunity nor a threat • No conclusions about patterns amongst types of firm.
9	Retailers' own-label brands	• Not favoured by firms • Seen as less profitable than manufacturers' brands • Overall, seen as a negative thing	• 60% of surveyed firms gave no view about retailers' own-label brands. The majority of these firms did not use retailers' own-label brands. • Retailers' own-label brands appear to be popular amongst remaining surveyed firms because of their utilisation of spare capacity and apparent complementarity with firms' marketing actions. The reasoning seems to vary amongst firm types. • Surveyed firms overwhelmingly claim that retailers' own-label brands are less profitable than are private brands. • A qualified majority of firms (31%, c.f. 7% disagreeing and 63% caliming "don't know") claim that retailers' own-label brands are a "positive thing for the firm, overall".

The surveyed firms appear to face rather concentrated markets. In 2005, the average figure was that just 9% of firms' suppliers supplied 75% of agriculturally-related inputs. On the selling side the figure was 39%. In both cases the average was little changed between 2000 and 2005, although concentration in the number of buyers may have eased somewhat in this period. However, the smallest firms clearly faced increased concentration, and only amongst medium-large firms (500-1000 million DKK in sales) and wholesalers, did concentration ease on both buying and selling sides. Processors reported a large increase in concentration amongst suppliers, but a moderate one amongst buyers. Retailers reported increasing concentration amongst suppliers. Examination of the co-occurrence between concentration in firms' buying and selling sides yielded a statistically-insignificant correlation co-efficient of around 7%. This indicates few firm-specific determinants of concentration amongst trading partners.

Surveyed firms' views are that the location of market power within the food marketing chain has changed little between 2000 and 2005. Around 70% of firms claimed that retailers "held the most market power", and about 15% claimed it was processors. About 10% did not know. Similarly, firms reported little change in the forms of exercise of market power in the food marketing chain: with claims of monopsony action far outweighing those of monopoly, and within-chain actions by retailers dominating the responses. When responses were disaggregated by choice of location of market power, the claimed instruments were quite different, with powerful processors being accused of exclusive trading and influencing the policy environment, and retailers' use of within-chain bargaining power and own-label brands being widely identified.

Some 78% of firms claimed to use written contracts in 2005. For those firms that use them, on average 64% of agriculturally-based transactions use contracts, which is far higher than for other input purchases. This difference was much more pronounced for small firms, and varied substantially amongst commodity sectors. Firms that were not vertically integrated showed no different preference for written contracts than did firms vertically integrated in some way.

Surveyed firms report that the content of contracts has changed substantially between 2000 and 2005. Contract items becoming more common include food safety, information regarding traceability and quality, responsibility for transport and delivery, and public liability. Firms at different stages of the chain report markedly different contract contents. Just 13-20% of firms claim that market conditions associated with competition and market power are "major barriers to new product development and

introduction", and the prevalence of introduction-related items (e.g. advertising and promotion of new products, and compensation for failed products) in contracts remains at about the same levels for 2000 and 2005.

Almost half the surveyed firms sold retailers' own-label brands in 2005, whereas just a third did so in 2000. For those firms, the share in sales of such brands is unchanged at about 20%. A substantial majority of firms (about 60% of those surveyed) claimed to know little about the impact of retailers' own-label brands, although large firms were more forthcoming with opinions. Notably, firms not using these brands generally did not venture an opinion, so that results presented represent informed views. A majority of responding firms stated that retailers' own-label brands are less profitable that the firms' own brands, and a majority also stated that retailers' own-label brands are "overall, a positive thing for the firm". Amongst commodity sectors, firms dealing with fruits and vegetables, pork, poultry and dairy products were the most enthusiastic about retailers' own-label. Perceived benefits included the utilisation of production capacity, there was mixed support for the idea that they compete with the firms' brands. Survey results revealed that few firms claimed that market power was a constraint on new products' development and introduction. However, there was a statistically-significant increase in the proportion of firms making such claims between 2000 and 2005.

Surveyed firms were generally indifferent to the prospect of change in antimonopoly regulation: specifically to a hypothetical change to make it "stricter". In aggregate, firms rated such a change as "neither an opportunity nor a threat". When disaggregated by size, stage and commodity sector, little pattern emerged although service providers and ingredients suppliers rated this a substantial opportunity.

8.2. Conclusions for commercial firms

Amongst surveyed firms, processors and small firms have seen the biggest declines in numbers of buyers and sellers, and the greatest increase in buyer and seller concentration. Retailers have seen numbers of suppliers fall, indicating consolidation amongst processors. These results reflect the falling numbers of farmers and firms in the Danish food marketing chain, and concentration amongst those that remain. The results indicate structural change in favour of large firms and toward a narrower food marketing chain.

As a response to the reduction in numbers of buyers and sellers, vertical integration has been a popular choice by firms. Use of contracts for transactions of farm and food products has also increased during the period surveyed, and this has been most pronounced amongst small firms and commodity-specialised firms. The use, and form, of vertical integration appears to be related to firms' experience of concentration amongst buyers and sellers, and it influences firms' claims about the location and exercise of market power, and the use of contracts in transactions.

Small firms studied here tend to view anti-competitive behaviour in the food marketing system rather differently than do larger firms. A fifth of them claim not to know how market power is exercised, which is a higher proportion than for most size classes. About half of small firms surveyed express the view that the exercise of market power is mostly activated on the buying (as opposed to selling) side, and involves networking and the manipulation of the policy process. Small firms emphasise within-chain actions by powerful firms, such as the threat of non-purchase ("de-listing") and shifting of risks within the chain. Small firms are not necessarily oriented against retailers, however, as they claim the same incidence of use of retailers' own-label as an instrument of market power, and enthusiasm for their use, as do other firms.

Commodity-specialised firms have seen rather greater concentration amongst suppliers than amongst buyers. This is not consistent with their identifying within-chain actions and exclusivity in purchasing (but not selling) arrangements as instruments of market power within the food marketing chain. Most specialised firms identify the use of retailers' own-label brands as an instrument of market power, apparently by way of their competing with the firms' own brands. However, specialised firms are positive, overall, about such brands.

Use of written contracts appears to be somewhat more popular amongst commodity-specialised firms than other firms. With respect to the responsibilities assumed in contracts, however, the content of contracts varies a great deal amongst specialised firms according to their commodity sector. The content of contracts used by firms specialised in fruits and vegetables have much in common with that applied by the poultry industry, and have little in common with that in the dairy industry. It appears that if there are anti-competitive pressures exerted by buyers through the contracting mechanism, then they impact the different commodity sectors quite differently.

Surveyed firms' attitudes to retailers' own-label brands indicate that they serve a useful marketing purpose, and although they are less profitable than firms' own brands,

are still viewed as a positive thing overall. The nature of the "marketing purpose" remains unclear, as firms do not overwhelmingly report benefits such as information exchange, although improved capacity utilisation is a popular response.

According to firms that claim that processors hold the most market power, processors exercise influence on the policy process. Rather fewer firms that identify retailers as holding the most market power claim that retailers do the same thing. Moreover, few firms claim that such actions as collusive "networking" and policy-related contacts with "organisations" and "politicians" are common, regardless of the claimed location of market power.

8.3. Conclusions for policy makers

Firms' claimed impacts of market power differ according to whether processors or retailers are the perceived holders and exercisers of market power. This result calls for food industry policy that addresses stages of the food marketing chain in specific ways, rather than as a "bloc" of undifferentiated organisations between farm and consumer.

In the view of surveyed firms, conventional impacts of market power (monopoly effects) appear to be attributed to powerful processors, as opposed to monopsony and within-chain actions, which are attributed to powerful retailers. Policies designed to combat the exercise of market power must therefore have differing problem diagnostics, targets and palliative instruments, according to the suspected origins of the market power. Surveyed firms appear to be uninspired by the consequences of stricter antimonopoly regulation, but quite clear in their concerns about slotting fees, de-listing threats and other within-chain actions by buyers.

It is a notable result that although firms identify consolidation and concentration much more strongly on the "supplier side" than amongst buyers of their products, they identify problems associated with market power on the buying side rather than the supplier side. This result is generally maintained despite the differences according to firms' views on the location of market power within the food marketing chain. The conclusion drawn is that the exercise of market power has less to do with market concentration than with narrowing of channels as described in the literature as "food convergence". This has been associated with the presence of one dominant ("focal") firm that may dictate conduct throughout the chain or network while not engaging in the behaviour itself.

In the competitive environment sketched by these survey results, small firms and processing firms are clearly facing greater challenges than other firms in terms of consolidation and concentration. However, their actions taken in terms of transactions (contracting and vertical integration) appear to be loosely linked to their perceptions of anti-competitive behaviour in the food marketing chain.

An unsurprising result of the survey is that firms specialised by commodity sector differ in their definition of competitive problems, and in the nature of their transactions. The striking differences in the content of contracts, for example, reflect not only logistic and physical differences amongst commodity sectors, but also the different incidence that industry-wide policies have. As an example, policies toward food safety and traceability are conceptually neutral across commodity sectors, but responsibility for them is being assigned quite differently amongst commodity sectors.

Few firms surveyed interpret the developments identified in this survey as an impediment to innovation, and there is comparatively little evidence of restrictions of firms' access to markets. This conclusion indicates that policies designed to encourage innovation might be developed and implemented independent of competitive conduct in markets.

8.4. Recommended future research

This survey addresses food industry firms across a spectrum of commodity sector, size and stage of chain. It uses a small sample and its degree of representation of the view of all food industry firms may be questioned. A first recommendation for further research is greater access to firms on a narrower range of questions directly associated with policies or commercial strategies that may assist firms in dealing with the modern competitive and transaction environment.

Price series have played a key role in industrial economics analysis in the past, but studies of vertical agro-industrial arrangements (as in this survey) usually do not access price data. An increasingly pressing research need is the development of convenient and meaningful indicators of competitiveness and within-chain equity that are not reliant on prices. The current study presents tables of results as an indication of firms' views on specific questions related to these topics, and represents a first step in identifying new sets of indicators.

Beyond the data and its analysis, a further research need is the exposure of firms to genuine policy scenarios. The current study deals with firms' problem definitions and their responses to them. Although this provides a unique data set of firms' views on such problems, it lacks strong policy advocacy because firms have not been presented with options for policy change. Such an exchange of information would necessarily involve firms directly with agencies of government.

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